

**NEW AMERICA**  
F O U N D A T I O N

September 9, 2005

Kevin J. Martin  
Chairman  
Federal Communications Commission  
445 12th St., SW  
Washington, DC 20554

Dear Chairman Martin:

On September 7, the New America Foundation held a Congressional staff briefing focused on the efforts of Wireless Internet Service Providers (WISPs) and others to provide affordable broadband service to both rural and urban communities across the country. Hurricane Katrina became the focus of a discussion about the importance of opening unassigned and underutilized TV band spectrum for license-exempt broadband networks and public safety use – both of which are rapidly expanding, but primarily on the increasingly crowded and less cost-effective 2.4 GHz band.

The speakers, including representatives of commercial WISP operators and municipalities, linked the opening of the TV band for unlicensed and licensed wireless broadband operation to the telecommunications breakdown in the Gulf Coast region in the wake of Hurricane Katrina. With many rural Louisiana shelters lacking communications, countless evacuees were left without the ability to communicate with friends and loved ones. Though it has not been covered extensively in the press, dozens of rural WISPs responded to this need and have poured into rural Louisiana to offer wireless broadband services to evacuees.

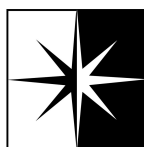
We applaud the FCC's move to open up the unused channels of the TV band for unlicensed use (Docket 04-186), which—as we have learned so forcefully following last week's disaster—is clearly a move in support of emergency preparedness and more affordable broadband access.

Unfortunately, the broadcast industry is engaging in a shameless effort to kill this proceeding by raising unwarranted claims about interference to DTV viewers. In response, the New America Foundation released the two attached documents rebutting the broadcast industry's claims and is disseminating them broadly. The first is a fact sheet refuting the main interference myths perpetuated broadcast lobbyists. The second contains the remarks of former FCC Chief Engineer Ed Thomas at our Hill briefing last week. We are disseminating these documents widely on the Hill in order to help head off any efforts to block the FCC from completing this critical rulemaking and realizing its benefits for public safety, rural broadband deployment and spectrum efficiency.

If you have any further questions regarding these materials, please contact me at (202) 986-2700, or [calabrese@newamerica.net](mailto:calabrese@newamerica.net).

Sincerely,

Michael Calabrese  
Vice President and Director, Wireless Future Program  
New America Foundation



**NEW AMERICA**  
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**FACT SHEET**

**How the DTV Transition Can Move the Nation – And  
Unused Spectrum – From ‘Broadcast to Broadband’**

***A response to interference myths propagated by the broadcast industry<sup>1</sup>***

By J.H. Snider

Senior Research Fellow, New America Foundation

**Background:** The broadcast industry’s digital TV (DTV) transition involves the future use of two different sets of frequencies (channels): channels 2-51 and channels 52-69. Channels 52-69 are all to be cleared out at the end of DTV transition in a national, contiguous band. Congressional legislation proposing a fixed deadline for the DTV transition focuses on the future of these channels. Since there are 210 local TV markets but only an average of 7 high-power local TV stations in each market, channels 2-51 will continue to have many unused channels after the DTV transition. These unused channels – often called “white space” – vary market-by-market, but represent sufficient spectrum in nearly every market to support a valuable expansion of wireless broadband services.

Last year under Chairman Powell, the FCC initiated a rulemaking (Docket 04-186) to allow a new generation of unlicensed wireless devices to use the unused TV channels within channels 2-to-51. The FCC recognized that new smart radio technologies would allow the unused TV channels to be used for broadband wireless services without interfering with local TV stations operating on nearby licensed channels. It also recognized that reallocating the unused broadcast spectrum would facilitate rural broadband Internet access, pervasive communications within the home and workplace, and supplemental public safety services. High-tech companies, wireless Internet service providers and consumer groups were highly supportive of this rulemaking. Broadcasters, including their vendors, were opposed. Broadcasters have now taken their arguments to Congress. This myth-fact sheet responds to their arguments.

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<sup>1</sup> For an example of the broadcast industry’s arguments, see MSTV’s video at [www.mstv.org/static.html](http://www.mstv.org/static.html) and FCC filing at [http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6517615193](http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6517615193)

***Myth #1: The FCC is proposing to allow unlicensed broadband networks and devices to operate on frequencies (channels) licensed to local TV stations.***

**Fact:** The FCC took an extremely conservative approach by proposing that unlicensed devices will be restricted to the unassigned and unused channels (“white space”) in the broadcast TV band. No local TV stations or other broadcast licensees operate on these frequencies—and broadcasters have no more legal right to use them than a homeowner who occupies a lot next to an adjacent publicly-owned lot. The homeowner may covet the lot and believe that development on it will diminish the value of his own lot. But he cannot prevent the government from allowing other to build on it. While there is additional “white space” in the TV band, the FCC has not proposed making it available. This includes various types of “underlay” and “overlay” rights to share access to licensed channels, such as unused capacity within a licensee’s grade B contour (the geographic area covered by a local TV station).

***Myth #2: There is no proven and practical technology to avoid interference to TV viewers and to licensed operators in each local TV market.***

**Fact:** The FCC has gone to great lengths to make sure that viewers are protected from harmful interference, which in fact is required by law. For example, it has proposed that only “smart” radios will be certified to operate in the TV band. All devices must have the capability to definitively and unambiguously establish that a TV band channel is not occupied at their location before they transmit. If a channel is in use, the device must avoid transmitting. They can do this a number of ways. The FCC mentions three:

- 1) **Listen-Before-Talk.** The unlicensed device senses the presence of a TV signal in order to select channels not in use. This approach, generally favored by the high-tech industry, has already been adopted by the International Telecommunications Union (ITU) and the FCC in the 5 GHz band so that unlicensed devices can avoid channels used by military radar, which are much harder to detect than TV signals.
- 2) **Database Plus Geolocation.** The unlicensed device determines its location and then consults a broadcast database to determine whether a particular TV channel is occupied. For example, an unlicensed device might contain a Global Positioning System (GPS) receiver, and use its position to verify that it was a minimum distance from a TV transmitter.
- 3) **Location Beacon.** The unlicensed device receives a locally transmitted signal (“beacon”) that identifies which TV channels may be used in the local area for unlicensed use. For example, a specialized beacon in a given TV market would directly identify which channels were unoccupied – and devices would back off.

In addition to the FCC’s proposals, there have been other proposals to deal with the broadcasters’ concerns. Some of these – along with a detailed response to the broadcast

industry interference claims – were filed in the FCC’s Docket 04-186 by a prestigious group of leading academic, corporate and former FCC staff engineers.<sup>2</sup>

***Myth #3: The broadcasters’ motive for opposing the FCC’s proposal to open empty TV channels in each market for license-exempt broadband networks is to prevent interference to their existing services rather than warehousing the spectrum for their own, future use.***

**Fact:** Broadcasters have a track record of warehousing spectrum, only to claim it later for their own exclusive use. For example, the NAB objected to Low Power FM radio stations gaining access to empty channels in the FM band – persuading Congress to overrule the FCC – and then developed a digital radio technology (IBOC) that allowed them to double their spectrum holdings in the FM band, increase the number of FM channels they could provide by a factor of more than 10:1, and expand their geographic range outside their original contour lines.

The NAB strategy in the TV band has been very similar. New America Foundation estimates that since 1997 broadcasters have acquired \$6 billion worth of TV band white space by expanding outside their original grade B contour. After the DTV transition, when more space is available, future requests for expanded contours are expected. In addition, in 2000 broadcasters won exclusive rights to use licensed portable video devices in unused TV channels. In other words, the NAB strategy has been to hold up others from using the unused channels, then claim to the FCC and Congress that only by giving it to them can the spectrum be utilized without interference. Regardless of the merits of the broadcasters’ technical arguments, the spectrum windfall they can receive from making them should be self-evident. The history of this sad saga of broadcast industry spectrum holdups followed by spectrum windfalls is described in a forthcoming New America Foundation Issue Brief.

***Myth #4: The broadcast industry’s technical claims about interference are respected by leading, independent engineers and have proved accurate in the past.***

**Fact:** NAB engineers have a track record of filing self-serving comments that are disputed by highly respected independent engineers. For example, after the FCC determined that community Low Power FM (LPFM) stations should be allowed to operate on the unused FM channels, which serve as guard bands between high-power licensees the NAB sponsored engineering studies demonstrating that there would be intolerable interference. This persuaded Congress to overrule the FCC and bar LPFM. But the FCC was never able to replicate the NAB’s findings – and a \$2 million FCC-financed MITRE study later refuted them. Moreover, the FM radio broadcasters’ new digital channels will create far more interference to existing broadcasters than LPFM.

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<sup>2</sup> See New America Foundation, et al., Technical Reply Comments, FCC Docket 04-186, In the Matter of Unlicensed Operation in the TV Broadcast Bands, January 31, 2005. Available at: [http://www.newamerica.net/Download\\_Docs/pdfs/Doc\\_File\\_2202\\_1.pdf](http://www.newamerica.net/Download_Docs/pdfs/Doc_File_2202_1.pdf). For a summary, see Marcus, Michael J. and Andrew Lippman, “Reclaiming the Vast Wasteland: Why Unlicensed Use of the White Space in the TV Bands Will Not Cause Interference to DTV Viewers,” New America Foundation Issue Brief (forthcoming)

The new digital channels are located immediately adjacent to each incumbent radio broadcaster's existing channel.

***Myth #5: The broadcast industry's interference scenarios are based on typical conditions rather than extreme, worst case conditions.***

**Fact:** If spectrum allocations were based on the type of worst case scenarios the broadcasters have proposed, there would be no digital TV, no digital radio, no unlicensed consumer devices (such as WiFi and cordless phones, of which there are hundreds of millions) and practically no innovation in spectrum utilization. This type of problem is also endemic to real estate development, where almost any type of development—even one with huge benefit for the overall community—may offer some type of minor annoyance to nearby property owners. Similarly, almost all new radio technologies create some type of interference in some type of situation to some incumbent user.

Like a local real estate planning commission, the FCC's task is to maximize overall consumer welfare from use of spectrum rather than take an absolutist view that any conceivable harm to incumbents in a worst case scenario is grounds to prevent development. Indeed, that's why the Communications Act directs the FCC to protect licensed services against "harmful" interference – and not interference per se. For example, the FCC recently faced this issue in the allocation of terrestrial rights to reuse satellite spectrum. It turns out that the spectrum used to send signals from satellite dishes to earth stations can be reused if the signal's angle of arrival is changed to be terrestrial and pointed away from the satellite dish pointing to the sky. The FCC estimated that in a tiny fraction of situations this could cause interference to incumbent users. But it decided that this level of interference was worth accepting because of the huge social value to be gained from opening up these frequencies to terrestrial as well as satellite service. Likewise, as noted above, the Pentagon has accepted the possibility of occasional or minor interference with military radar in the 5 GHz band in order to allow WiFi and other license-exempt broadband networks to share the band using "smart" radio technology.

***Myth #6: The broadcast industry has revealed the technical conditions under which it has conducted its interference studies so that independent researchers can attempt to replicate them.***

**Fact:** The broadcast industry has made claims about interference in such a way that no independent third party can verify them and assess their general applicability. Until the broadcast industry publicly releases detailed technical information about its studies, claims about their general applicability should be treated with utmost skepticism. And if it happens that the broadcasters have indeed identified a flaw in the FCC's rules, it is quite possible that a minor technical modification might address it.

***Note:*** For a general briefing on the pending DTV transition legislation and how it could impact wireless broadband services, see the New America Foundation Policy Brief, "Speeding the DTV Transition: Facts & Policy Options," available at: [http://www.newamerica.net/Download\\_Docs/pdfs/Doc\\_File\\_2389\\_1.pdf](http://www.newamerica.net/Download_Docs/pdfs/Doc_File_2389_1.pdf)

**Remarks of Ed Thomas**

**New America Foundation & House Future of American Media Caucus Luncheon,  
September 7, 2005, B-354 Rayburn House Office Building**

**DTV 201:**

**How the DTV Transition Can Move the Nation from “Broadcast to Broadband”**

***Biography:** Edmond Thomas held the position of Chief Engineer of the Federal Communications Commission until June 1, 2005, when he joined the law firm of Harris, Wiltshire & Grannis as a partner specializing in technical policy. Prior to joining the Commission, Mr. Thomas served as President and CEO of MMRadiolink, President and CEO of RSL USA, and President of Science and Technology at Bell Atlantic. At Bell Atlantic, he was responsible for new product development. In 2003, for his work in advancing digital wireless communication, he was one of five people selected by Forbes Magazine to be in the magazine’s “E-gang.” In the same year, he was named by Wired Magazine as one of the five most influential technical people in Washington. Ed Thomas can be reached at Harris Wiltshire & Grannis, email: [ethomas@harriswiltshire.com](mailto:ethomas@harriswiltshire.com), phone: 202-730-1305.*

Good afternoon everyone. It’s a pleasure to be here. Before I begin you should know that Microsoft is a client. The views you are about to hear are my own, but you should also be aware that Microsoft shares them.

What I would like to do today is to talk to you about the underutilized terrestrial over the air TV Spectrum containing channels 2 to 51.

I am sure that you are aware that many spectrum pundits have argued that over the air, terrestrial-based/broadcast TV is very inefficient. They believe that spectrum with such excellent propagation characteristics should be reclaimed and put to much better modern use. They are quick to point out that over the air TV is inefficient from a technical standpoint. And, in addition, it is economically inefficient since only 15% of TV viewers get their programs from over the air broadcasts while 85% obtain it via cable or satellite.

Though these arguments have merit, in my judgment, they miss the current political reality. There is little likelihood that the FCC will reclaim additional TV spectrum in the foreseeable future.

There is, however, a way to improve the technical and economic efficiency of the TV spectrum without affecting the broadcasters, the DTV transition or the 15% of the population who receive their TV over the air. This is exactly what the FCC white spaces NPRM issued May 2004 (docket 04-186) is designed to do. This proceeding proposes that the unused portion of the TV spectrum, the white spaces, be used for unlicensed broadband communications. It is important to remember that no one currently has a license or a right to this spectrum, though the broadcasters act as if they do. This spectrum is ready-made for unlicensed broadband applications for the following reasons:

- First, as I will explain in a moment, low power unlicensed systems coupled with smart radios will all but eliminate any possibility of interference. Remember, since these devices are proposed to be unlicensed they are forbidden to cause interference to licensed services. In the highly unlikely event that they do. The FCC NPRM requires them to automatically cease operation on the interfered with channel.
- Second, TV spectrum because of its propagation characteristics will provide larger coverage areas for a given emitted power level relative to systems operating above 1GHz. This translates to less capital expenditure for deployments that in turn will cause cost effective broadband Internet access to be more rapidly deployed in sparsely populated rural areas.
- Third, more white spaces or bandwidth exists in rural areas than in metropolitan areas. This will allow broadband to be easily brought to rural America where it is sorely needed.
- Fourth, TV spectrum enjoys superior penetration characteristics relative to systems operating above 1GHz, notably the existing unlicensed spectrum in the 2.4GHz and 5GHz. This translates to better signal quality and reliability in challenging environments involving foliage and structural obstacles.
- Fifth, for equivalent range and throughput, systems operating in the TV white spaces use lower emitted power levels than radios designed for use in the 2.4GHz and 5GHz unlicensed bands. This translates to better battery life.

I know you and the Commission have been subjected to intense lobbying by the broadcasters to prevent this from happening. They argue that the approach proposed in the NPRM will cause interference and slow down the DTV transition. Let me assure you that this is simply untrue. In its proposal the Commission has gone to great lengths to make certain that broadcasters are protected and that the transition can move forward unimpeded. Allow me to explain:

The proposed FCC rules require that smart radios be deployed in the TV band. These radios must have the capability to definitively and unambiguously establish which TV channels are occupied at their location before they transmit. They must then avoid transmitting in those channels.

They can also continuously sense their environment. Finally, they must have the capability to instantaneously exit a channel when either they sense a TV signal or are instructed to do so by the service provider.

As an example, consider the situation where a previously vacant TV channel goes into use as part of the DTV transition. The unlicensed transceiver will sense the change the instant the TV transmitter goes on the air and vacate that channel. Or it will be notified in advance of the change by the service provider and vacate the channel. Either way the broadcaster is protected.



Transceivers such as these are well understood and can be built cheaply in volume. In fact they are quite similar to WiFi transceivers on the market today.

Three primary public policy benefits will occur if the FCC authorizes the unlicensed use of the TV white spaces.

- First, cost effective rural broadband Internet access deployment will be expedited.
- Second, as a supplement to licensed public safety applications, unlicensed TV white spaces based technology can provide cost effective, incremental, interoperable capacity for innovative emergency services such as IP voice, video, and high-speed data. Widely available, inexpensive and compatible equipment with superior range and building penetration properties could prove very valuable in times of emergency.
- Finally, the wireless office and home where voice, video, music, data and other applications can be distributed from a single connection will become a reality.

In spite of the overwhelming benefits of allowing unlicensed use of the TV white spaces and probably because of the intense lobbying of the broadcasters the FCC has put on hold this proceeding initiated in May of 2004. This, in my judgment, is a shame and should not be allowed to continue.

I strongly urge Congress to direct the Commission as the expert government agency to bring this proceeding to a conclusion. If there is any doubt as to the level of protection which should be afforded to broadcasters, then Congress should also direct the FCC labs to conduct an on the record experiment to determine what is appropriate. The FCC laboratory has a long history of expertise in all facets of TV transmission. Recall they conducted the experiments that led to the DTV allocations and technical transition plan.

A golden opportunity exists to extend the social and economic benefits of broadband to all Americans. I urge Congress and the FCC not to be persuaded by the invalid self-serving claims of a few and to move forward expeditiously with FCC Docket 04-186.

Thank you for your time and attention.